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EXAMINER	
THOMPSON, JAMES A	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/823,027	SUN ET AL.	
	Examiner	Art Unit	
	James A Thompson	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6, 9 and 11-24* is/are rejected.

7)☒ Claim(s) *3,4,7,8 and 10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 March 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "21" in figure 2. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 3 is objected to because of the following informalities: "edge energy is determined used a Prewitt filter" should be modified to "edge energy is determined using a Prewitt filter". Appropriate correction is required.

3. Claim 4 is objected to because of the following informalities: "Guassian" should be changed to "Gaussian". Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recites that "the user-defined maximum distance is 3" but does not give any unit of measurement for the distance. Is the maximum distance 3 pixels, 3 centimeters, 3 decimeters, or 3 times some other measurement unit? This is not clear, therefore claim 13 fails to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claims 19 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 recites that "the filter size is 2F+1" and claim 20 recites "the filter size is 2F-1." Claims 19 and 20 are both dependent upon claim 1, which recites "applying a filter to each pixel in the image". The filter sizes 2F+1 and 2F-1 are for one-dimensional filters. The size of two-dimensional filters would be directly related to the value of F^2 and not F. This is further evidenced by applicant's own specification (page 5, lines 27-28 of specification). Since the image is inherently two-dimensional, claims 19 and 20 are self-contradictory and do

not therefore particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Further, the quantity "F" is not defined in claims 19 and 20, nor in claim 1, upon which claims 19 and 20 depend. Is this the F(i,j) described in the specification? Applicant needs to properly identify and describe what "F" is in claims 19 and 20 in order for the claims to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 24 recites "[a]n article including instruction that, when executed, result in:" and proceeds to list results (a) through (e). Claim 24 does not recite any means to achieve results (a) through (e), nor does claim 24 recite how the instructions are stored and/or executed. Are they stored on a computer-readable medium and executed as a computer program? Are they written instructions for an operator to follow? Are they some form of mathematical procedure to perform? What particular means are used to perform the instructions? Further, claim 24 does not recite what kind of article is being claimed. Is it an article of manufacture? Is it a written article containing instructions? Claim 24 is indefinite in regard to these points and therefore does not particularly point out and distinctly claim the subject matter that applicant regards as the invention.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1, 6, 9, 12, 19-20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schoepflin (US Patent 6,574,353 B1) in view of Ranganath (US Patent 5,239,591).

Regarding claim 1: Schoepflin discloses determining edge energy for each pixel in an image (column 7, lines 3-5 of Schoepflin). In order to obtain an edge energy representation for the current image frame (column 7, lines 3-5 of Schoepflin), edge energy for each pixel in said image frame must be determined. Further, Schoepflin discloses producing an edge map (column 7, lines 6-8 of Schoepflin).

Schoepflin further discloses using a distance transform to produce a filter map (column 7, lines 8-10 of Schoepflin). The energy image is a filtered image, wherein said filtering performs the operation of processing the image data and generating an image of the energy values. The filter map is the map of energy data values since said energy data values are based on a binary map of the image edges (column 7, lines 6-8 of Schoepflin).

Schoepflin further discloses applying a filter to each pixel in the image (column 7, lines 57-60 of Schoepflin), wherein the filter applied is dependent upon a filter map value

for each pixel (column 7, lines 39-43 of Schoepflin). A deformation process to locate an object (column 7, lines 57-60 of Schoepflin) is a form of image filtering. The filtering is dependent upon a filter map value for each pixel since the template used for the deformation is deformed to minimize an energy metric (column 7, lines 39-43 of Schoepflin) and said filter map is the map of energy data values since said energy data values are based on a binary map of the image edges (column 7, lines 6-8 of Schoepflin).

Schoepflin further discloses producing an output value for each pixel in the image (column 10, lines 65-67 and column 6, lines 11-12 of Schoepflin). A video window (figure 1(54) of Schoepflin) is used to display each output frame (column 6, lines 11-12 of Schoepflin), which will occur for each frame after each frame has been processed (column 10, lines 65-67 of Schoepflin). If the entire frame is displayed (column 6, lines 11-12 of Schoepflin), then inherently an output value for each pixel in the image is produced and output on said video window.

Schoepflin discloses that said edge map is determined using a Canny edge detection algorithm (column 7, lines 6-8 of Schoepflin). However, Schoepflin does not disclose expressly comparing the edge energy for each pixel to a threshold, producing an edge map.

Ranganath discloses comparing the edge energy for each pixel to a threshold (column 10, lines 57-62 of Ranganath), producing an edge map (column 10, lines 62-64 of Ranganath).

Schoepflin and Ranganath are combinable because they are from the same field of endeavor, namely the processing of edge and contour data in digital images. At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to use a threshold to produce the edge map from the edge energy data, as taught by Ranganath. The motivation for doing so would have been to assure that the output of the Canny function taught by both Schoepflin and Ranganath is the edge energy (column 10, lines 62-64 of Ranganath). Therefore, it would have been obvious to combine Ranganath with Schoepflin to obtain the invention as specified in claim 1.

Regarding claim 6: Schoepflin discloses that, when a pixel is determined to be an edge pixel, the corresponding value is set to 1 in the edge map (column 7, lines 6-8 of Schoepflin).

Schoepflin does not disclose expressly that pixels with an edge energy above the threshold are labeled as edge pixels.

Ranganath discloses that pixels with an edge energy above the threshold are labeled as edge pixels (column 10, lines 57-62 of Ranganath).

Schoepflin and Ranganath are combinable because they are from the same field of endeavor, namely the processing of edge and contour data in digital images. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a threshold to determine which pixels are edges, as taught by Ranganath. The motivation for doing so would have been to assure that the output of the Canny function taught by both Schoepflin and Ranganath is the edge energy (column 10, lines 62-64 of Ranganath), and thus assure that the results properly depict the edges of the image. Therefore, it would have been obvious to combine Ranganath with Schoepflin to obtain the invention as specified in claim 6.

Further regarding claim 9: Since the boundary pixels in the edge map define the overall region, said boundary pixels are indeed edges. Further, it is not known what the value of the

pixels outside said boundary are, so consideration of said values must be terminated at said boundary. Therefore, said boundary pixels in the edge map would be set as edge pixels.

Further regarding claim 12: Ranganath discloses that said detected edges (column 9, lines 47-51 of Ranganath) are considered to be boundaries of the binary image (column 9, lines 51-53 of Ranganath). Therefore, it is inherent that the boundaries defining an image should not be filtered out. Otherwise, the image regions are no longer defined. The only way to completely prevent filtering out the boundary edges is to set the filter map values to zero at the pixels corresponding to said boundary edges. Then, no filtering at all will occur to said boundary edges.

Regarding claim 19: Schoepflin further discloses applying a filter to each pixel in the image (column 7, lines 57-60 of Schoepflin). Said filter must inherently be of a finite size. "F" is simply an undefined variable. Therefore, F can be set to be $\frac{\{\text{size of filter}\}-1}{2}$, thus making the filter size equal to 2F+1.

Regarding claim 20: Schoepflin further discloses applying a filter to each pixel in the image (column 7, lines 57-60 of Schoepflin). Said filter must inherently be of a finite size. "F" is simply an undefined variable. Therefore, F can be set to be $\frac{\{\text{size of filter}\}+1}{2}$, thus making the filter size equal to 2F-1.

Regarding claim 24: The arguments regarding claim 1 are incorporated herein. The method of claim 1 is performed by an article (figure 1 of Schoepflin) including instructions with which to execute said method (column 4, lines 16-23 of Schoepflin).

10. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schoepflin (US Patent 6,574,353 B1) in view of Ranganath (US Patent 5,239,591) and Schweid (US Patent 6,449,389 B1).

Regarding claim 2: Schoepflin in view of Ranganath does not disclose expressly that the edge energy is determined using a Sobel filter.

Schweid discloses using a Sobel filter to measure the level of variation (column 4, lines 17-20 of Schweid).

Schoepflin in view of Ranganath is combinable with Schweid because they are from the same field of endeavor, namely analysis of digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the Sobel filter to determine the level of variation in the image, as taught by Schweid, particularly the edge energy levels, as taught by Schoepflin. The motivation for doing so would have been that a Sobel filter is a simple and inexpensive measurement of the local pixel level variation (column 4, lines 47-50 of Sobel). Therefore, it would have been obvious to combine Schweid with Schoepflin in view of Ranganath to obtain the invention as specified in claim 2.

Regarding claim 3: Schoepflin in view of Ranganath does not disclose expressly that the edge energy is determined using a Prewitt filter.

Schweid discloses using a Prewitt filter (column 4, lines 20-23 of Schweid) to measure the level of variation (column 4, lines 17-20 of Schweid).

Schoepflin in view of Ranganath is combinable with Schweid because they are from the same field of endeavor, namely the analysis of digital image data. At the time of the invention,

it would have been obvious to a person of ordinary skill in the art to apply the Prewitt filter to determine the level of variation in the image, as taught by Schweid, particularly the edge energy levels, as taught by Schoepflin. The motivation for doing so would have been that a Prewitt filter is another filter apart from the Sobel filter, discussed in the arguments regarding claim 2, that can be used (column 4, lines 20-23 of Schweid) for determining the level of variation (column 4, lines 17-20 of Schweid). Therefore, it would have been obvious to combine Schweid with Schoepflin in view of Ranganath to obtain the invention as specified in claim 3.

11. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schoepflin (US Patent 6,574,353 B1) in view of Ranganath (US Patent 5,239,591) and Brill (US Patent 5,694,491).

Regarding claim 4: Schoepflin in view of Ranganath does not disclose expressly that the edge energy is determined using a derivative of Gaussian filter.

Brill discloses using a derivative of Gaussian filter (column 6, lines 57-61 of Brill) to spatially filter an image for grating contrast detection (column 6, lines 29-34 of Brill).

Schoepflin in view of Ranganath is combinable with Brill because they are from the same field of endeavor, namely the analysis of digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use a derivative of Gaussian filter to determine the edge energy. The suggestion for doing so would have been that a derivative of Gaussian filter can be used to determine the grating contrast level (column 6, lines 29-34 and lines 57-61 of Brill), which is the same principal as detecting the edge energy

level. One simply needs to apply the derivative of Gaussian filter taught by Brill in the context of edge energy, as taught by Schoepflin. Therefore, it would have been obvious to combine Brill with Schoepflin in view of Ranganath to obtain the invention as specified in claim 4.

Regarding claim 5: The arguments regarding claim 4 are incorporated herein. Brill further discloses that said derivative of Gaussian filter is normalized (column 7, lines 51-55 of Brill), thus making said derivative of Gaussian filter a normal filter.

12. Claims 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schoepflin (US Patent 6,574,353 B1) in view of Ranganath (US Patent 5,239,591) and Wilensky (US Patent Application Publication 2004/0042662 A1).

Regarding claim 11: Schoepflin in view of Ranganath does not disclose expressly that the distance transform is the minimum value of a user-defined maximum distance and a distance of a current pixel to a nearest edge in the edge map.

Wilensky discloses applying a distance transform to each pixel (paragraph 0072, lines 1-7 of Wilensky) in a region of the image, wherein the size of said region is determined by the user (figure 1(54); and paragraph 0048, lines 1-2 and lines 15-17 of Wilensky). The distance transform can therefore be no more than the value of the maximum distance of the region size, which is selected by the user, even if said distance transform would be if the user did not select said region size. Therefore the distance transform is the minimum value of said user-defined maximum distance and a distance calculated from the current pixel.

Schoepflin in view of Ranganath is combinable with Wilensky because they are from the same field of endeavor, namely digital image data processing and analysis. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the region selection taught by Wilensky to the distance transform of Schoepflin in view of Ranganath. Then, the distance transform would be the minimum value of said user-defined maximum distance and a distance of a current pixel (as taught by Wilensky) to a nearest edge in the edge map (as taught by Schoepflin in view of Ranganath). The motivation for doing so would have been to decrease the amount of needed computer resources by only computing the section of the image that is in question (paragraph 0048, lines 15-17 of Wilensky). Therefore, it would have been obvious to combine Wilensky with Schoepflin in view of Ranganath to obtain the invention as specified in claim 11.

Further regarding claim 13: The size of the region is user-selected and can therefore be set to any size desired. Therefore, a size of 3, and thus a maximum distance of 3, can be set, 3 being 3 pixels, 3 centimeters, or 3 of any other unit of measurement.

13. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schoepflin (US Patent 6,574,353 B1) in view of Ranganath (US Patent 5,239,591) and de Queiroz (US Patent 5,799,112).

Regarding claim 14: Schoepflin in view of Ranganath does not disclose expressly that the filter further comprises a two-dimensional low-pass filter.

De Queiroz discloses filtering an image with a two-dimensional low-pass filter (figure 6(1411) and column 9, lines 45-48 of de Queiroz). Since the input image (figure 1 of de Queiroz) is a two-dimensional image, then said low-pass filter is a two-dimensional low-pass filter.

Schoepflin in view of Ranganath is combinable with de Queiroz because they are from the same field of endeavor, namely the processing and analysis of digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to filter the image with a two-dimensional low-pass filter, as taught by de Queiroz. The motivation for doing so would have been to reduce image artifacts (column 6, lines 39-44 of de Queiroz). As is well-known in the art, low-pass filters cause a certain amount of blurring in the image which reduces the effects of Moiré patterns and other forms of false edges and contours. Therefore, it would have been obvious to combine de Queiroz with Schoepflin in view of Ranganath to obtain the invention as specified in claim 14.

Regarding claim 15: Schoepflin in view of Ranganath does not disclose expressly that the filter further comprises two one-dimensional low-pass filters.

De Queiroz discloses filtering an image with two one-dimensional low-pass filters (figure 8(154,155) and column 10, lines 32-37 of de Queiroz). The horizontal (figure 8(154) of de Queiroz) and vertical (figure 8(155) of de Queiroz) sub-band filters operate on the horizontal and vertical sub-band components of the image (column 10, lines 32-37 of de Queiroz). Since one sub-band is the low-pass (LL) sub-band (column 9,

lines 13-16 of de Queiroz), then one type of said horizontal and vertical sub-band filters are one-dimensional low-pass filters.

Schoepflin in view of Ranganath is combinable with de Queiroz because they are from the same field of endeavor, namely the processing and analysis of digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to filter the image with two one-dimensional low-pass filters, as taught by de Queiroz. The motivation for doing so would have been to reduce image artifacts (column 6, lines 39-44 of de Queiroz). As is well-known in the art, low-pass filters cause a certain amount of blurring in the image which reduces the effects of Moiré patterns and other forms of false edges and contours. Therefore, it would have been obvious to combine de Queiroz with Schoepflin in view of Ranganath to obtain the invention as specified in claim 15.

Regarding claim 16: The arguments regarding claim 15 are incorporated herein. Since there are two separate one-dimensional filters, one horizontal (figure 8(154) of de Queiroz) and one vertical (figure 8(155) of de Queiroz), then the filter map taught by Schoepflin (column 7, lines 8-10 of Schoepflin), discussed above in the arguments regarding claim 1, would be modified for the two separate one-dimensional filters taught by de Queiroz, thus producing separate filter maps, one for horizontal operations and one for vertical operations.

14. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schoepflin (US Patent 6,574,353 B1) in view of Ranganath (US Patent 5,239,591), Apostolopoulos (US Patent 5,850,294), and de Queiroz (US Patent 5,799,112).

Regarding claim 21: Schoepflin in view of Ranganath the method of claim 1. Therefore, the arguments regarding claim 1 are incorporated herein.

Schoepflin in view of Ranganath does not disclose expressly a facsimile machine comprising a receiver operable to receive an input image; a processor operable to decompress the input image, producing a decompressed image; that said method is performed by a post-processor; and a print engine operable to print the decompressed and adaptively filtered image.

Apostolopoulos discloses a facsimile machine (figure 1 of Apostolopoulos) comprising a receiver (figure 1(24) of Apostolopoulos) operable to receive an input image (column 1, lines 39-42 of Apostolopoulos); a processor (figure 1(18) of Apostolopoulos) operable to decompress the input image, producing a decompressed image (column 2, lines 19-24 of Apostolopoulos); performing an image processing method with a post-processor (figure 1(26) and column 1, lines 44-48 of Apostolopoulos); and outputting the decompressed and adaptively filtered image (as shown in figure 1 at label "Output Signal").

Schoepflin in view of Ranganath is combinable with Apostolopoulos because they are from the same field of endeavor, namely the processing and analysis of digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to perform the method taught by Schoepflin in view of Ranganath using a facsimile machine, as taught by Apostolopoulos. The motivation for doing so would have been to have a physical system with which to produce a physical output representation. Therefore, it would have been obvious to combine Apostolopoulos with Schoepflin in view of Ranganath.

Schoepflin in view of Ranganath and Apostolopoulos does not disclose expressly a print engine operable to print the decompressed and adaptively filtered image.

De Queiroz discloses a print engine (figure 3(400) of de Queiroz) operable to print (column 6, lines 45-49 of de Queiroz) a processed image (column 6, lines 40-45 of de Queiroz).

Schoepflin in view of Ranganath and Apostolopoulos is combinable with de Queiroz because they are from the same field of endeavor, namely the processing and analysis of digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the printer of de Queiroz to print the resultant image created by the method of Schoepflin in view of Ranganath. The motivation for doing so would have been to obtain a hardcopy of the resultant image. Therefore, it would have been obvious to combine de Queiroz with Schoepflin in view of Ranganath and Apostolopoulos to obtain the invention as specified in claim 21.

Further regarding claim 22: Schoepflin discloses that the input image is a color image (column 7, lines 12-13 of Schoepflin).

Further regarding claim 23: Schoepflin discloses implementing the entire image processing apparatus, such as the facsimile machine taught by Apostolopoulos, on a programmed digital computer (figure 2 of Schoepflin) which contains a single processor (figure 2(28) of Schoepflin). Therefore, all the image processing operations are performed on a single processor, so the processor and post-processor are the same processor performing different sets of instructions.

15. Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schoepflin (US Patent 6,574,353 B1) in view of Ranganath (US Patent 5,239,591) and well-known prior art.

Regarding claim 17: Schoepflin in view of Ranganath does not disclose expressly that the reconstructed image is in RGB color space. However, **official notice is taken** that using an RGB color space for an output image is old, well-known, and expected in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a RGB color space for the reconstructed image. The motivation for doing so would have been to be able to display the image on an RGB monitor or print the image using a color printer with RGB ink.

Regarding claim 18: Schoepflin in view of Ranganath does not disclose expressly that the reconstructed image is in LAB color space. However, **official notice is taken** that using a LAB color space for an output image is old, well-known, and expected in the art. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a LAB color space for the reconstructed image. The motivation for doing so would have been that LAB color space is considered to be a good color space in which to represent an image since LAB color space is based on the physical light detection characteristics of the human eye.

Allowable Subject Matter

16. Claims 7, 8 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Claim 7 recites that "the threshold is selected to be the minimum of a user-defined maximum threshold and half of the maximum edge energy within a current image block." The support for claim 7 is found on page 4, lines 13-21 of the specification. Examiner has been unable to find this particular limitation for selecting a threshold, wherein said threshold is used to determine the energy map of an image. Claims 8 and 10 depend upon claim 7, and therefore contain *inter alia* all of the limitations of claim 7. Claims 8 and 10 are therefore considered to contain allowable subject matter.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A Thompson whose telephone number is 703-305-6329. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703-308-7452. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Thompson
Examiner
Art Unit 2624

JAT
27 October 2004

THOMAS D LEE
PRIMARY EXAMINER